

Constraints on the Structure of the Border Ranges Fault System, South-Central Alaska from Integrated 3-D Inversion of Gravity/Magnetic Data

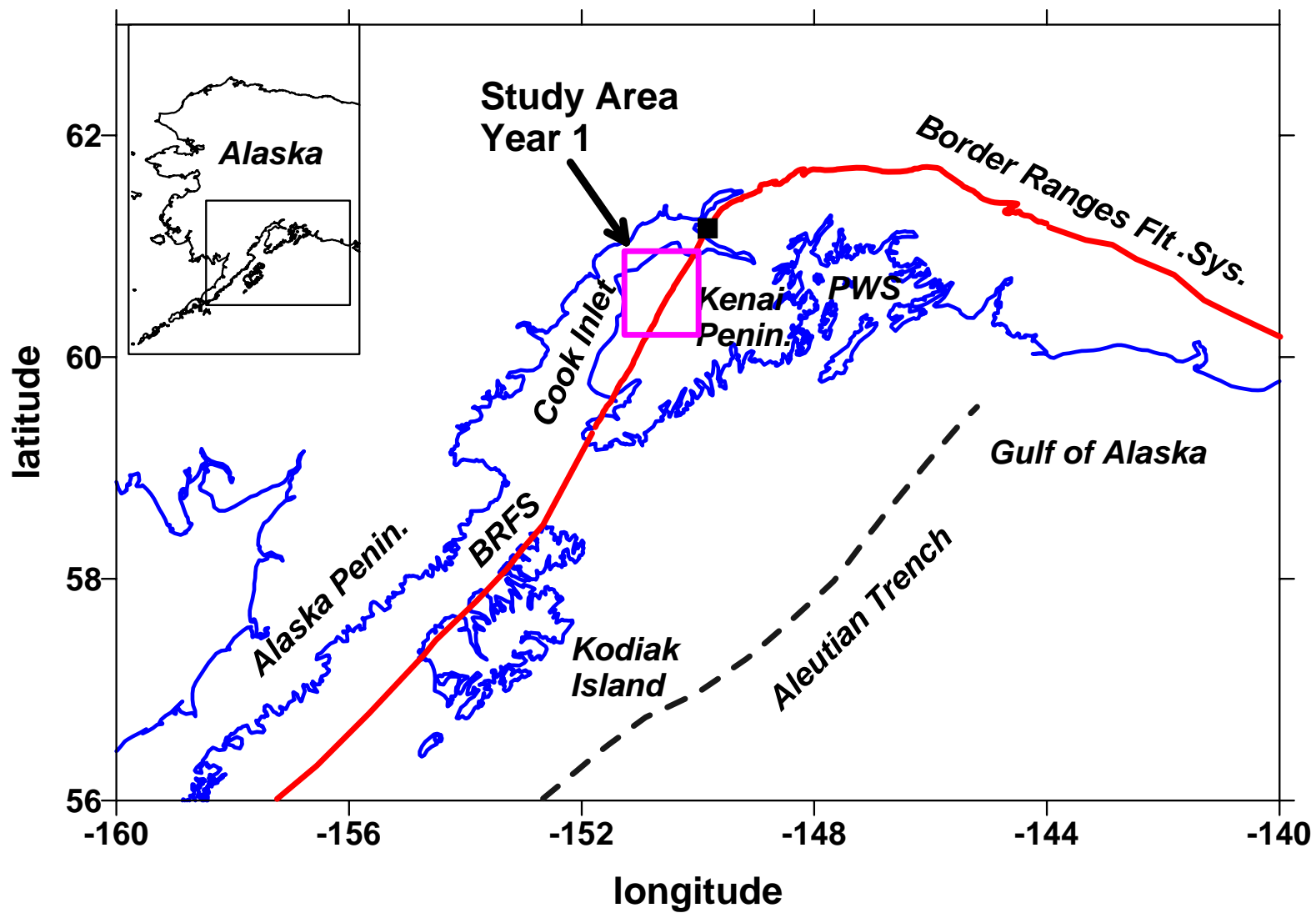
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Significance

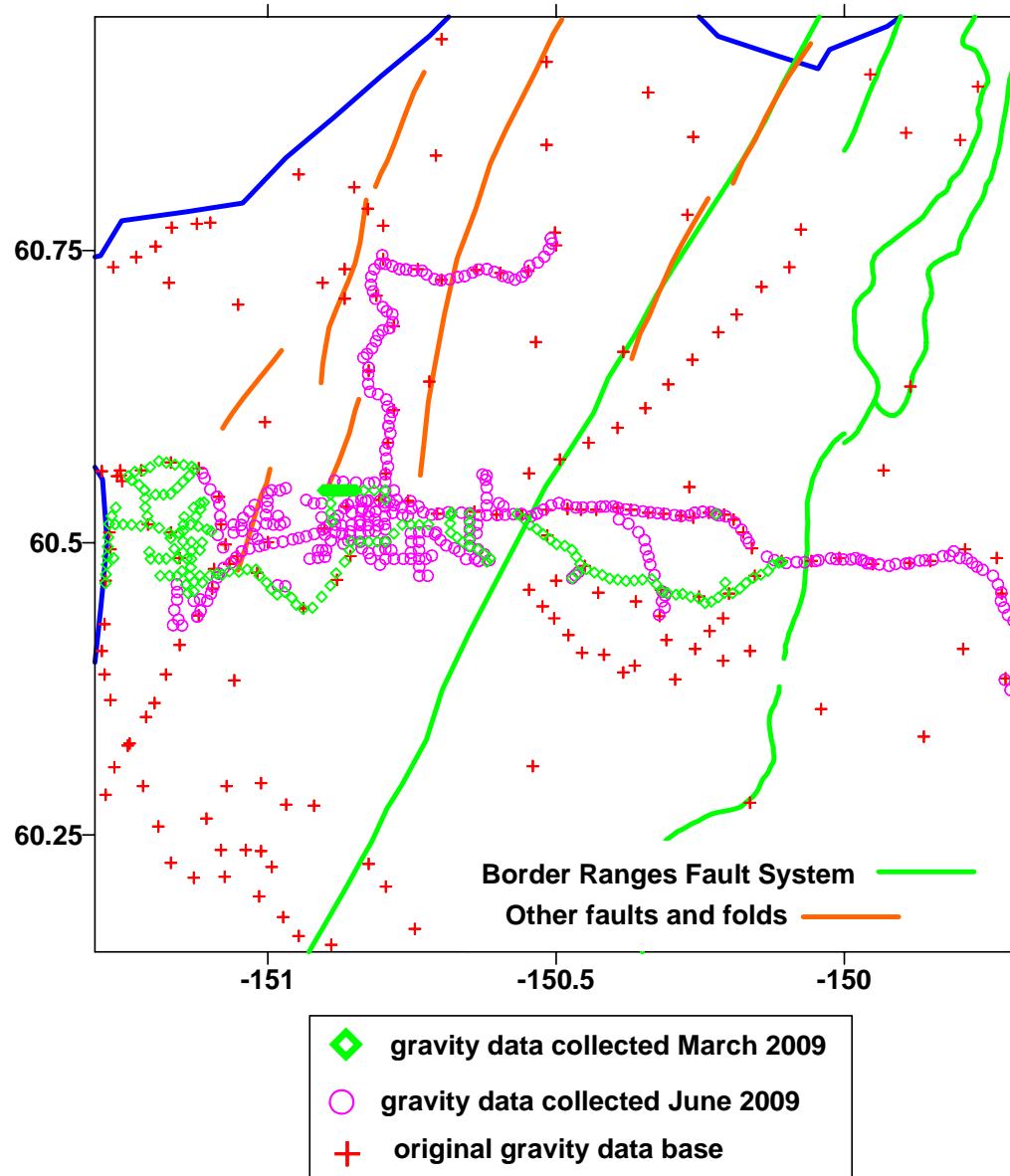
- The Border Ranges Fault System (BRFS) bounds the major petroleum producing region of Cook Inlet Basin
- The geometry, timing, sense and amount of movement along BRFS and its influence on basin formation are poorly known
- We will test models of BRFS structure and basin evolution using a novel 3-D inversion of gravity and magnetic data



Red is BRFS. Box is our study area for year 1.



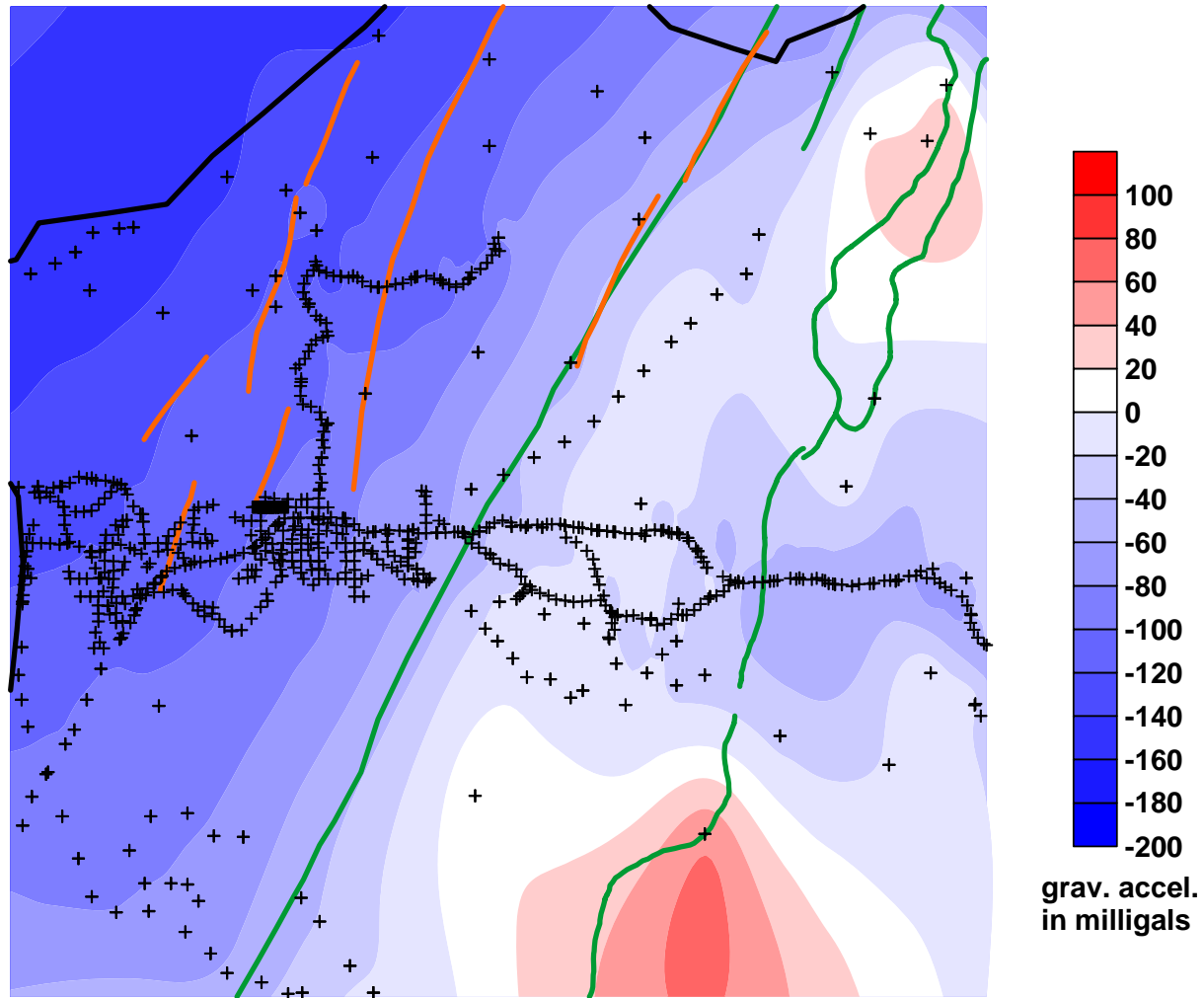
View (looking southeast) across BRFS from Kenai Lowlands to Kenai Mountains



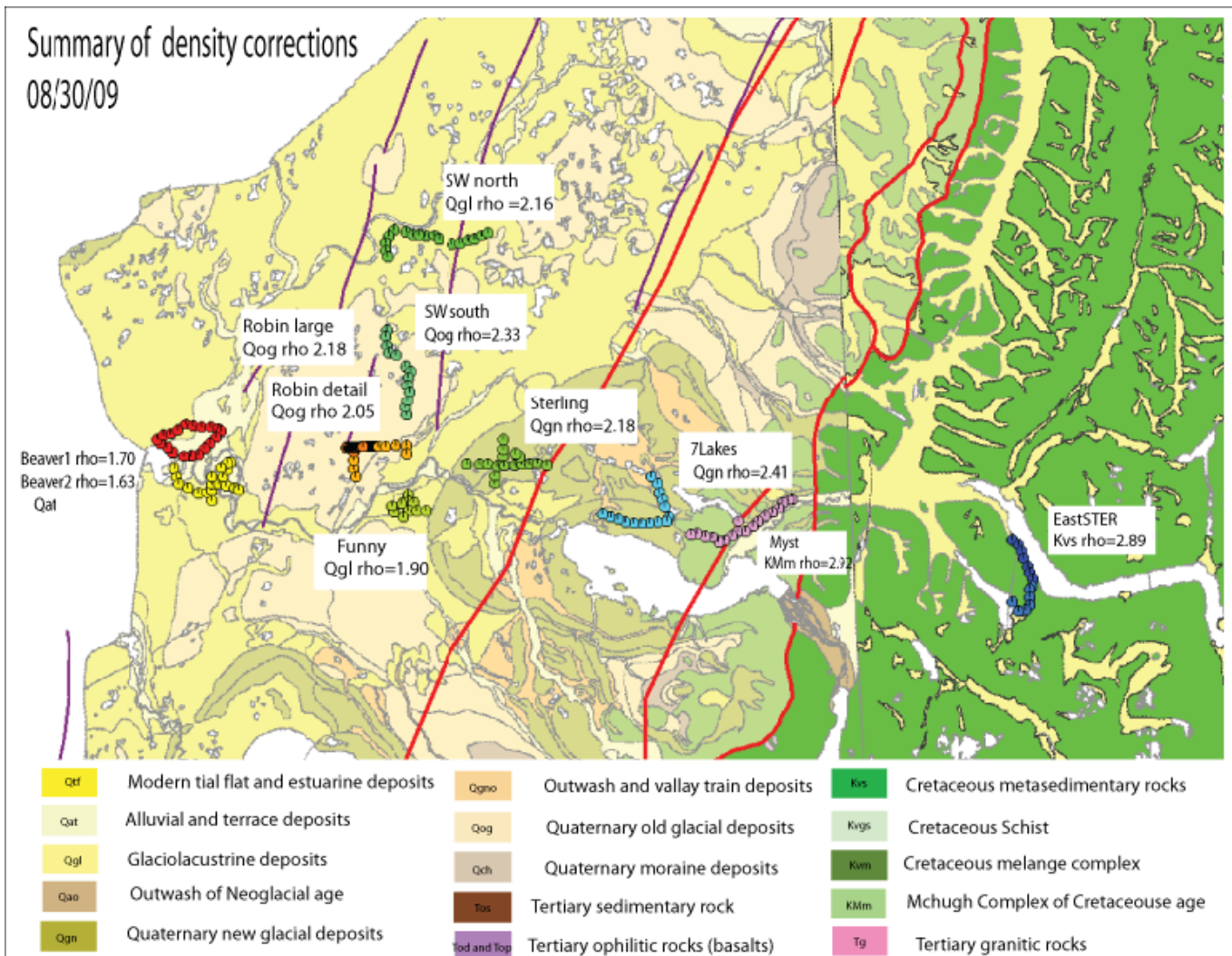
In the spring and summer of 2009 we collected over 500 gravity observations (green and magenta symbols) to help constrain our models of the BRFS. Note sparseness of original data (red plusses).



Setting up GPS unit in the field (required for precise location of gravity observation points)



Our latest map of variation in gravitational acceleration across the BRFS.



We have collected closely spaced gravity observation in subregions to estimate variations in near-surface densities as indicated. Density logs from oil and gas wells will also be used to help build near-surface density models.

Second Year Tasks

- Take additional gravity observations in Anchorage area to help constrain structure of northeastern Cook Inlet Basin
- Complete testing of forward modeling code for magnetic data (testing of forward modeling code for gravity data is complete)
- Complete and test inversion code
- Test viable models of the BRFS